

## CLAIMS

1. A method of treating water which comprises,  
forming a mixture of a particulate natural organic substrate with a flow control  
5 component,  
exposing the water to contact with oxygen containing gas over a large surface  
area, and  
causing the water to trickle through a column of the mixture,  
wherein the particulate natural organic substrate is adapted to support growth of  
10 aerobic bacteria and the flow control component is adapted to create a plurality of  
sinuous pathways for the water trickling through the column.
2. A method according to claim 1 wherein the oxygen containing gas is caused to  
permeate through the column whereby the sinuous pathways comprise the large  
15 surface area.
3. A method according to claim 1 wherein the particulate natural organic substrate  
comprises at least one of peat, moss, sphagnum moss, compost, lichen, straw, hay,  
mulch, pulp, rice husks, wheat husks and mixtures thereof, and the oxygen containing  
20 gas comprises air.
4. A method according to claim 3 wherein the particulate natural organic substrate  
comprises peat.
- 25 5. A method according to claim 1 wherein the flow control component comprises a  
particulate material having a high surface area per unit volume.
6. A method according to claim 5 wherein the flow control component has a surface  
area per unit volume of at least  $250 \text{ m}^2/\text{m}^3$ .
- 30 7. A method according to claim 5 wherein the flow control component comprises  
material in the form of particulates, mouldings or mesh.

8. A method according to claim 1 wherein the water is passed through at least one canister loaded with a material having an average contact surface area per cubic metre volume greater than  $250 \text{ m}^2/\text{m}^3$  before it trickles through the column.

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9. A column for the treatment of water comprising a mixture of a particulate natural organic substrate with a flow control component, wherein the particulate natural organic substrate is adapted to support growth of aerobic bacteria, the flow control component is adapted to create a plurality of sinuous pathways for the water trickling  
10 through the column, and the mixture has an average contact surface area per unit volume of at least  $375 \text{ m}^2/\text{m}^3$ .

10. A column according to claim 9 wherein the particulate natural organic substrate comprises at least one of peat, moss, sphagnum moss, compost, lichen, straw, hay,  
15 mulch, pulp, rice husks, wheat husks and mixtures thereof.

11. A column according to claim 9 wherein the particulate natural organic substrate comprises peat, and the volume ratio of natural organic substrate to flow control component falls within the range 1:4 to 2:1.

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12. A cartridge comprising an upper canister loaded with media adapted to provide a high surface area for contact between air and water trickling through the cartridge, the media having an average contact surface area per unit volume of at least  $250 \text{ m}^2/\text{m}^3$ , and a column as defined in claim 8 arranged to receive water which has trickled down  
25 through the upper canister to enter the column across an upper surface of the column.

13. A cartridge according to claim 12 comprising a middle canister interposed between the upper canister and column, whereby the middle canister is adapted to receive water which has trickled down through the upper canister and to allow the  
30 water to trickle therethrough and on to the upper surface of the column, and the middle canister is loaded with media having an average surface area per unit volume of at least  $375 \text{ m}^2/\text{m}^3$ .

14. A cartridge according to claim 13 comprising at least one conduit extending through the column, middle canister and upper canister wherein the conduit is porous and is arranged to facilitate permeation of air from the conduit into the upper canister.

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15. A grey water treatment assembly comprising,  
a collection reservoir for grey water,  
a treatment module comprising a column according to claim 9,  
a delivery system for feeding the grey water from the collection reservoir to flow  
10 through the treatment module, and  
a storage reservoir arranged to receive treated grey water after it has passed through the treatment module.

16. A grey water treatment assembly according to claim 14 wherein the treatment  
15 module comprises a cartridge according to claim 12.

17. A grey water treatment module comprising,  
a casing for housing a plurality of sockets,  
a spigot providing in a base of each socket,  
20 air outlet means for each spigot in communication with air inlet means to the module,  
liquid outlet means at the base of each socket, and  
a column according to claim 9 mounted on each spigot.

25 18. A grey water treatment module comprising,  
a casing for housing a plurality of sockets,  
a spigot provided in a base of each socket,  
air outlet means for each spigot in communication with air inlet means to the module,  
30 a liquid outlet means at the base of each socket, and  
a cartridge according to claim 13 mounted on the spigot.